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10/589,639	08/16/2006	Toshio Isozaki	294568US0PCT	2292
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER LACLAIR, DARCY D	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 02/03/2009	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/589,639	Applicant(s) ISOZAKI ET AL.	
	Examiner Darcy D. LaClair	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **11/12/2008**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The new grounds of rejection set forth below are necessitated by applicant's amendment filed on **11/12/2008**. In particular, **Claim 1** has been amended to recite *dihydroxybiphenyl is used in an amount of 5 to 50 mol% with respect to the total amounts of divalent phenol as a raw material in the formation of the aromatic polycarbonate resin*. This limitation was not present in the claims at the time of the preceding Office Action. Thus, the following action is properly made **FINAL**.

Information Disclosure Statement

2. With regard to the information disclosure statement (IDS) submitted on August 16, 2006, the examiner refers applicant to the statement at the bottom of the IDS indicating "all references considered except where lined through." Accordingly, the information disclosure statement and reference AO, ie. JP 2004-59690 has been considered by the examiner.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. **Claims 2 and 8** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With regard to Claim 2, applicant has described “rubber-like” polymers in the specification, but not rubber polymers. The specification supports only rubber modified styrene or rubber non-modified styrene (see p. 10-11, par [0024]).

With regard to Claim 8, applicant has amended the claim to describe the alkali and alkaline metal salts as “monomers.” The specification does not appear to support this recitation. Additionally, the objection over the word “kind” in Claim 8 has been reconsidered, and is withdrawn.

4. **Claim 8** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant has described “at least one monomer” selected from “alkali metal sulfonate, alkaline earth metal sulfonate, alkali metal polystyrene sulfonate, and alkaline earth metal polystyrene sulfonate.” Alkali metal sulfonate and alkaline earth metal sulfonate are salts used as flame retardants. It is not understood from the specification that these salts are polymerized or polymerizable, for that matter, and therefore the term

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monomer (implying a moiety capable of undergoing polymerization) does not appear to apply to these species.

Claim Rejections - 35 USC § 103

5. **Claims 1-3, 5-6, and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Laughner et al. (US 5,369,154)** in view of **Meyer et al. (US 2004/0030090)**.

With regard to Claim 1, Laughner teaches a polycarbonate blend of good impact and flexural strength, which consists of component (a), from about 5 percent to about 95% of polycarbonate which can be composed of an aromatic dihydric phenol with a carbonate precursor, or other polycarbonates, as well as (e) a rubber modified styrene/acrylonitrile copolymer up to 50%. (See col 2 line 35-50)

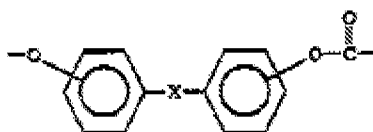
With regard to applicant's A-2, the examiner takes the position that as it requires 90% to 0% mass, the presence of this component is optional, and therefore not required to meet the limitations with respect to Claim 1.

With regard to applicant's (B) amorphous styrene, or Laughner's (e), Laughner teaches several olefinic polymers which can contain a vinylic group (styrene) in combination with the polycarbonate. These include both styrene in combination with rubbers and without. Most similar to those compounds disclosed in applicant's specification is component (e), which is a styrene/acrylonitrile copolymer (SAN), or a rubber modified SAN copolymer, such as acrylonitrile-butadiene-styrene copolymer (ABS). (See col 11 line 35-42) The incorporation of a comonomer with styrene typically

reduces the crystallinity of the styrene. Additionally, applicant's amorphous styrene is described in the specification as being ABS or other rubber modified styrene copolymers. (applicant's p. 11 par [0024]) An ABS copolymer therefore meets applicant's requirement for an amorphous styrene.

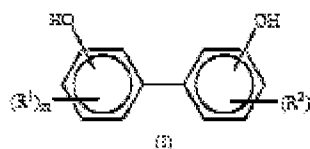
With regard to applicant's A-1, or Laughner's (a), Laughner teaches a polycarbonate composed of a dihydric phenol and a carbonate precursor. As the dihydric phenol, Laughner teaches the preferred general formula (I), shown below on the left, next to applicant's formula (right)

A preferred aromatic polycarbonate is characterized by repeated units corresponding to the general formula:



wherein X is a divalent, linear or cyclic C₁-C₁₅ hydrocarbon radical, a single bond, -O-, -S-, -S₂-, -SO-, -SO₂-, or -CO-. Each aromatic ring may additionally contain, instead of hydrogen, up to four substituents such as C₁-C₄ alkyl hydrocarbon or alkoxy radicals, aryl or aryloxy radicals, or halo radicals.

(Laughner, col 4)



[Formula I]

[0045] (wherein R¹ and R² represent independently a group selected from a hydrogen atom, an alkyl group having 1 to 6 carbon atoms, a cycloalkyl group having 5 to 7 carbon atoms, a substituted or unsubstituted aryl group having 6 to 12 carbon atoms and halogen atom; m and n are each an integer of 1 to 4).

(Applicant's p. 9-10 Formula I)

For Laughner's compound, where X is a single bond and one of the hydrogens on each ring in Laughner's formula is substituted, (as Laughner indicates in the text accompanying the formula, col 4 line 47-53), this formula is consistent with applicant's Formula I, once in the polymer chain. Applicant's formula displays "-OH" groups, where -O- groups are shown in Laughner's work. This merely reflects whether the structure is shown before or after being reacted with the carbonate precursor to generate a polycarbonate compound. This compound taught by Laughner constitutes a

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dihydroxybiphenyl used as the raw material in generating an aromatic polycarbonate resin, and therefore meets applicant's limitation with respect to (A-1).

Laughner teaches a dihydroxybiphenyl, compound, and indicates that the compound of formula I can be employed as a copolymer of two or more bisphenols in combination with acid or hydroxyl terminated reactants. (See col 4 line 37-65) The disclosure does not specify the content of the dihydroxybiphenyl monomer in the polycarbonate resin. Meyer teaches polycarbonates with special terminal groups, and processes for producing such resins. (see abstract) These resins are composed of phenolic compounds including diphenols such as dihydroxybiphenyls, (see par [0078]), with 4,4'-dihydroxybiphenyl (DOD) as a preferred diphenol (see par [0079]). Meyer exemplifies as a co-polycarbonate which contains 0.14 mole of bisphenol A, 0.06 mole of dihydroxybiphenyl, 0.223 mole of diphenyl carbonate, 0.0028 mole of additional compounds. (See Example 11, par [0192]-[0193]) This is a total of 0.4258 moles; with 0.06 moles of dihydroxybiphenyl, Meyer's compound contains 14.1 mol% of dihydroxybiphenyl, which is within applicant's claimed range. Meyer teaches that these polycarbonates do not exhibit high zero sheer viscosity or undergo degradation under thermal stress such as extrusion or injection molding (see par [0018]) and can be mixed with other thermoplastics, and processed into molded articles or extrudates. (See par [0117]) They are particularly applicable for safety panels for vehicles and aircraft, production of fibres and threads, production of molded articles and precision injection molded parts, production of optical instrument parts, mobile telephone housings, applications in the automobile sector. (See par [0119]-[0148]) This is consistent with

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Laughner's use of the polycarbonate, which includes films, fibers, extruded sheets, molded or shaped articles, especially appliance and instrument housings, automobile body panels, and components for the automotive and electronic industry. (See col 2 line 10-19) Furthermore, it would be obvious for Laughner to employ the polycarbonate of Meyer in order to enjoy the benefit of the decreased viscosity which would improve the processing and injectibility of the resin, as well as the improved thermal stress resistance, which would allow the composition to be processed via injection molding or extrusion with less risk of degradation.

With regard to Claim 2, Laughner teaches component (e) as described above with regard to **Claim 1**. (See col 11 line 35-42) Laughner teaches a rubber-modified SAN (styrene-acrylonitrile) copolymer including such monomers as **styrene**, having a connecting valence on a ring carbon with groups such as **acrylonitrile**, methacrylonitrile, **methyl methacrylate**, ethyl methacrylate, and others. (See col 12, line 25-55)

With regard to Claim 3, Laughner teaches that carbonate copolymers can be formed when a bisphenol is reacted with a carbonic acid derivative and a **polydiorganosiloxane** to yield a siloxane/carbonate block copolymer. (col 4 line 66- col 5 line 2) This would generate an additional polycarbonate compound not the resin of (A-1), and Laughner teaches that the various polycarbonates presented can be used as blends. (col 5 line 21-25) This teaches the siloxane/carbonate block copolymer containing polydiorganosiloxane used in combination with the other polycarbonate resin, and teaches a combination that is consistent with the combination required by applicant.

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With regard to the content of each, applicant requires 10 to 100 mass% of the polycarbonate (A-1), and 0 to 90 mass% of the polycarbonate (A-2). This range is sufficiently broad to encompass almost any blend ratio of the polycarbonate species taught by Laughner.

With regard to Claim 5, Laughner teaches that fillers such as talc, clay, or mica can be used (col 16 line 63-65), and constitute up to 40% of the composition. (col 17 line 1-4) This encompasses the range required by applicant.

With regard to Claim 6, Laughner teaches component (f), a core-shell graft polymer, (col 15-16) as an impact modifier in an amount up to 25%. (col 2 line 50-57)

With regard to Claim 11, Laughner teaches samples prepared by injection molding. (col 17 line 29)

6. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Laughner et al. (US 5,369,154)** and **Meyer et al. (US 2004/0030090)**, in view of **Paul et al. (US 4,569,970)**

The discussion of **Laughner** and **Meyer**, above in **paragraph 5**, is incorporated here by reference.

With regard to Claim 4, Laughner teaches that a copolymer can be formed by reacting a carbonic acid derivative and a polydiorganosiloxane (See col 4 line 66-col 5 line 5) and directs the reader to Paul for a discussion of the generation of siloxane/carbonate block copolymers. (See col 5 line 3) Paul teaches a copolycarbonate containing 4.5% to 10% by weight of **polydimethylsiloxane**. (See

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Paul col 5 line 58- col 6 line 3) Laughner has explicitly directed the reader to these compounds, therefore it would be obvious to one of ordinary skill in the art to employ the copolymers of Paul in the invention of Laughner in view of Meyer.

7. **Claims 7-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Laughner et al. (US 5,369,154)** and **Meyer et al. (US 2004/0030090)**, in view of **Laughner et al. (US 4,786,686)**

The discussion of **Laughner** and **Meyer**, above in **paragraph 5**, is incorporated here by reference.

With regard to Claim 7, Laughner '154 teaches that additives can be included improve the ignition resistance of the composition (See col 16 line 54), and suggests that these additives typically do not exceed 5% by weight of the composition (See col 17 line 2). Laughner '154 does not explicitly teach the addition of alkali metal salts. However other work by the same inventor, Laughner '686, in the same art, namely improving the quality of polycarbonate (or carbonate polymers compositions), teaches the incorporation of metal salts of sulfur compounds, such as aromatic sulfonates, sulfates, and others, where the cation is preferably an alkali metal. (See col 4 line 26-59) Laughner '686 goes on to teach that the metal salt would preferably be included in amounts ranging from 0.001 to 2 percent, by weight, in order to provide resistance to the effects of burning. (See col 5 line 33-46) In both cases, the same inventor working in the same system presents polycarbonate compositions. The more recent art, Laughner '154, presents improvements to the polycarbonate composition, and glosses

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over the trivial additives, such as flame retardants, which are well known and well established in the art. The inventors own work, Laughner '686, from six years prior, presents these flame retardants, in a similar system (a polycarbonate in combination with a SAN copolymer and a impact modifier) (See abs). It would have been obvious, not only for one of ordinary skill in the art, but for this specific practitioner, to have made the combination of these well know elements with the improvements of the composition described in Laughner '154. Furthermore, it would have been obvious to one of ordinary skill in the art to incorporate the alkali metal salts in the composition of Laughner '154 in view of Meyer, in order to realize flame retardance provided by this known additive.

With regard to Claim 8, Laughner '686 teaches aromatic sulfonates where the cation is preferably an alkali metal. (See col 4 line 26-59).

With regard to Claims 9 and 10, since the particular limitation involved are the same as the ones described in claims 5 and 6, attention is drawn to the discussion of **Claims 5 and 6**, above, in **paragraph 4**. These limitations are fully taught by Laughner '154, and by Laughner '154 in view of Meyer. It would therefore be obvious to one of ordinary skill in the art that a combination of Laughner '154 and Meyer with Laughner '686 would readily include any elements taught by Laughner '154.

Response to Arguments

8. Applicant's arguments filed **10/22/2008** have been fully considered. Specifically, applicant argues **(A)** Claims 2 and 8 have been amended to recite "monomer" rather

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than "kind" to clarify these claims, **(B)** Claims 1 and 2 have been amended to improve awkward wording and remove the use of the indefinite phrase "rubber-like" in favor of "rubber," respectively, **(C)** The anticipation rejection in view of Laughner '154 has been overcome by the amendment to Claim 1, now requiring *dihydroxybiphenyl used in an amount of 5 to 50 mol% with respect to the total amounts of divalent phenol as a raw material in the formation of the aromatic polycarbonate resin*, not disclosed by Laughner '154, which is silent with respect to the use of a particular content of dihydroxybiphenyl used to generate the polycarbonate resin, and **(D)** The obviousness type rejections over Laughner '154 with support from Paul or Laughner '686 are traversed on the grounds that Laughner '154 does not disclose a specific content of dihydroxybiphenyl, and this is not remedied by either of the cited references; furthermore the Declaration submitted demonstrates the criticality of the now claimed 5 - 50 mol% of dihydroxybiphenyl.

With respect to argument (A), applicant's arguments have been considered, and the objections are withdrawn. The objection to Claims 2 is withdrawn in light of applicant's amendment. The amendment of the word "monomer" improves the clarity of these claims. Support for the amendment in Claim 2 is noted in on page 11, in paragraph [0024]. The objection over the word "kind" in Claim 8 has been reconsidered, and is withdrawn.

With respect to argument (B), applicant's arguments have been considered and the rejection of Claims 1 and 2 is withdrawn in light of applicant's amendments. Support for the amendments to Claim 1 is acknowledged pursuant to paragraphs

[0021]-[0023], pointed out by applicant. Support for the amendment to Claim 2 with regard to the word "rubber" is not seen.

With respect to argument (C) and (D), applicant's arguments have been considered and the rejection of Claims 1-3, 5, 6, and 11 been withdrawn *in light of applicant's amendment*. Support for the amendment in paragraphs [0021]-[0023] is acknowledged. While applicant has submitted comparative data to support the criticality of the amended range, the content of PTFE is not held consistent between the inventive examples and the comparative examples. Because the halogen (fluorine) moieties in the PTFE would contribute to the flame retardance of the composition, it is not possible to make a determination as to the effect of applicant's claimed criticality. Additionally, the examples provide only one polymer within applicant's claimed range for dihydroxybiphenyl content of the polycarbonate, so it can not be determined if the effect of the dihydroxybiphenyl is unexpected within that range, or merely on a continuum.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Darcy D. LaClair
Examiner
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/Vasu Jagannathan/

Supervisory Patent Examiner, Art Unit 1796